NON-PUBLIC?: N
ACCESSION #: 8806100184
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Zion, Unit 1 PAGE: 1 of 3

DOCKET NUMBER: 05000295

TITLE: Reactor Trip Due to Generator Trip/Over Excitation
EVENT DATE: 05/07/88 LER #: 88-011-00 REPORT DATE: 06/06/88

OPERATING MODE: 1 POWER LEVEL: 006

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR SECTION
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: Peter J. Pawlak, Tech Staff Engineer
TELEPHONE #: 312-746-2084 Ext. 331

COMPONENT FAILURE DESCRIPTION:
CAUSE: X SYSTEM: TL COMPONENT: XPT MANUFACTURER: 0026
REPORTABLE TO NPRDS: N

SUPPLEMENTAL REPORT EXPECTED: No

ABSTRACT: On 05/07/88 at 1701 hours, while attempting to synchronize the generator, the Nuclear Station Operator noticed zero voltage for the generator excitation. While attempting to raise the excitation voltage, a generator trip was received which caused a turbine trip. At 1706 hours, the resulting transient caused a reactor trip to occur due to a low-low level in steam generator 1B. Subsequent investigation revealed that the operator was "fooled" into seeing zero excitation due to corrosion on phase B in the primary of the potential transformer circuit. Specifically, the corrosion took place in the series resistors used to limit fault current should the potential transformer fail. The SV (overvoltage) relay, which monitors phase A & C voltages, tripped the unit due to over excitation.

All safety related equipment functioned per design.

Surveillance of the series resistors will be added to the preventive maintenance schedule to prevent recurrence of this type of event.

(End of Abstract)

Energy Industry Identification System (EIIS) codes are identified in the text as (xx)

A. PLANT CONDITIONS PRIOR TO EVENT:

MODE 1 - Power Operation RX Power 6% RCS (AB) Temperature/Pressure 553 degrees F/ 2235 psig

B. DESCRIPTION OF EVENT:

On 05/07/88 at 1701 hours, while preparing to synchronize the generator (TB) to the system grid, the Nuclear Station Operator noticed zero voltage for the generator excitation. While attempting to raise the excitation voltage, a generator/turbine trip was received which in turn tripped the running feedwater pump (SJ). At 1706 hours, the auxiliary feedwater pumps (BA) could not maintain steam generator (JB) level and a reactor trip (JC) occurred due to a low-low level in steam generator 1B.

C. CAUSE OF EVENT:

Subsequent investigation revealed that the operator noticed zero excitation voltage due to corrosion in the primary of the potential transformer circuit. The corrosion took place on phase B of the series resistors used to limit fault current in the event a potential transformer should fail. The control room voltmeter monitors phase B voltage which explains why the voltmeter did not register any excitation voltage. By attempting to increase the excitation voltage, the setpoint threshold of the SV (overvoltage) relay, which monitors phase A & C voltage, was exceeded thus tripping the generator/turbine due to over-excitation. Therefore, the cause of the event was corrosion in the primary of the potential transformer circuit, namely, the series resistors.

The series resistors are situated within sealed bushings which tap off the 23.7 KV isolated phase bus duct. A paper/fiber like gasket is presently used for sealing between the metal detail of the bus duct and the bushing which houses the resistors. It is believed that the gasket allowed the infiltration of moisture from the bus duct overhead. In the summer of 1987, some leakage occurred from the water tubes of the bus duct air coolers which would explain how moisture was introduced into the bus duct. During circulation, the moisture would have been distributed through the bus duct and to the potential transformer cubicle.

D. ANALYSIS OF EVENT:

This event had no safety consequences. The unit was shut down and all equipment functioned per design.

E. CORRECTIVE ACTIONS:

Electrical Maintenance disassembled the resistors (three per phase) on all three phases. Six of the resistors exhibited signs of corrosion and were replaced. The remaining three resistors exhibited no signs of corrosion and were cleaned prior to reinstallation. Upon reinstallation, the resistors were treated with Griptol insulation paint as added protection against corrosion.

The Station Electrical Engineering Department is presently conducting an investigation on how best to address the problem of corrosion within the potential transformer bushings. One suggestion is to apply a silicone sealant around the metal detail of the bus duct to prevent further moisture from entering the bushings/potential transformer cubicle. A second suggestion is to drill a weep-hole in the bottom metal detail so that the resistor assembly can "breathe". A third and final suggestion is to modify the potential transformer circuit such that the resistor assemblies are mounted directly to the potential transformer cubicle as opposed to inside the bushings.

F. PREVIOUS OCCURRENCES:

On 08/25/80, a unit one reactor trip occurred for essentially the same reason. At that time, corrosion resistant hardware was installed to prevent future occurrences. To prevent recurrence, surveillance of the series resistor assemblies will be added to the preventive maintenance schedule for both units. A work request will be initiated to inspect the Unit 2 assemblies for evidence of corrosion during the upcoming unit two outage.

G. COMPONENT FAILURE DATA:

MANUFACTURER NOMENCLATURE MODEL NUMBER MFG PART NUMBER
Ohmite 2524

Commonwealth Edison
Zion Generating Station
101 Shiloh Blvd.
Zion, Illinois 60099
Telephone 312/746-2084

June 6, 1988

U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

Dear Sir:

The enclosed Licensee Event Report number 88-011-00, Docket No. 50-295/DPR-39 from Zion Generating Station is being transmitted to you in accordance with requirements of 10CFR50.73(a)(2)(iv), which requires a 30 day written report when there has been an actuation of the Reactor Protection System.

Very truly yours,
/s/ E. J. Fuerst for
G. J. Pliml
Station Manager
Zion Generating Station

GJP/sdd
Enclosure: Licensee Event Report
cc: NRC Region III Administrator
NRC Resident Inspector
INPO Record Center
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